

These elements result from the following normal places :—

Mean Equinox 1882.0.

G.M.T.	α				δ	No. of Obs.
	^h	^m	^s	^s		
1882, Oct. 8.0	10	29	22.76	± 0.140	$-10^{\circ} 15' 48''.7 \pm 4''.06$	21
Nov. 24.0	9	8	32.92	± 0.237	$-27^{\circ} 7' 2.9 \pm 1.22$	16
1883, Jan. 29.0	6	13	34.56	± 0.241	$-22^{\circ} 54' 19.5 \pm 2.22$	16

The probable errors given above are only approximate, as the changes which took place in the nucleus and the different parts of the same used by different observers would preclude any definite determination of their values.

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*Astrophysical Observations made during the Year 1882 at the
Herény Observatory, Hungary. By Eugen de Gothard.*

(Communicated by Dr. N. de Konkoly.)

Spectroscopic Observations.

In the year 1882 the spectra of 147 fixed stars and of two comets have been observed; the former with a small Zöllner ocular spectroscope, with one set of three prisms and a cylindrical lens; the latter with the same apparatus with a slit, the cylindrical lens being omitted.

On the appearance of the great September comet I endeavoured to perfect the instrument afterwards used for observing faint spectra. It consists of a Merz half-prism, movable by a fine micrometer screw; a bright line formed by a narrow slit in the focus of a small lens serves as an index. The table giving the motion of the micrometer screw in wave-lengths was constructed by a graphical method, from observations of nineteen known lines in the solar spectrum, made on November 6.

Out of the 147 stars mentioned above, the details are given only of 43 stars not included in Secchi's Catalogue.

Classification of Star-Spectra observed during the year 1882.

(Dr. Vogel's types.)

No.	Constellation.	Type I a.	Type II a.	Type III a.	Diff. and uncertain types.	Total
1	Cassiopeia	β, δ, ϵ	α		γ	5
2	Cepheus	α	γ		β	3
3	Perseus	β, δ	$\alpha, \gamma, \epsilon, \eta, \kappa?$	ρ	ζ, ν, τ, θ	12
4	Auriga	β, θ	α	π		4
5	Ursa major	$\beta, \zeta, \text{Alcor. } \epsilon, \eta, \delta? \alpha$				8
6	Boötis	γ	δ			2
7	Corona bor.	α, β			θ	3
8	Hercules	$\delta, \epsilon, \iota, \nu, \sigma, \tau, \phi, \rho$	$\beta, \lambda, \pi, \xi?$	α	$\gamma, \zeta, \mu, \theta, \nu$	20
9	Lyra	$\alpha, \beta, \gamma, \zeta, \epsilon, 16 \text{ Fl.}$		$\delta, 13 \text{ Fl.}$		8
10	Cygnus			Birmingham		1
11	Andromeda	α, μ	γ, δ	β		5
12	Triangulum	β	α			2
13	Aries	$\beta, \gamma, 14 \text{ Fl.}$	α	35 Fl.		5
14	Taurus	$\beta, \eta, 17, 27 \text{ Fl.}$		α		5
15	Gemini	α, γ	β		δ	4
16	Canis. min.	α, β				2
17	Leo	$\alpha, \beta, \delta, \zeta, \sigma$	γ		η	7
18	Serpens	δ, ϵ, μ	α, η, θ			6
19	Ophiuchus	$\alpha, \gamma, \eta, \iota, \lambda, \nu, 72 \text{ Fl.}$	$\beta, \epsilon, \kappa, \sigma, 68 \text{ Fl.}$	δ	$\zeta, \sigma, 70 \text{ Fl.}$ Com. III. 6	17
20	Aquila	α, λ, θ	γ, η			5
21	Delphinus	ζ				1
22	Pegasus	α, θ	β, ϵ		$\gamma \text{ (I. 6?)}$	5
23	Scorpius			α		1
24	Sagittarius	$\delta, \lambda, \mu, \pi, \rho, \sigma$	ξ		ζ	8
25	Scutum. Sob.		$7 \text{ H. } 3 \text{ H}$		6 H.	3
26	Capricornus	δ	β			2
27	Aquarius	γ	α, β			3
28	Pisces austr.	α				1
28		77	38	11	21	147

Number of observations, 169.

Number of days, 8.

March 15 and 16, June 17, July 15 and 24, August 7, and September 4 and 5.

Stars not in Secchi.

θ *Coronæ bor.*, mag. 4, bluish-white.

I endeavoured in vain to see some lines in the spectrum of this remarkable star.

ϕ *Herculis*, mag. 4, bluish-white.

H β , H γ , and D, very strong. I. *a.*

τ *Herculis*, mag. 3-4, bluish-white.

H β and H γ rather faint, but observed with certainty. I. *a.*

σ *Herculis*, mag. 4, bluish-white.

The intensity of H β and H γ is characteristic. I. *a.*

π *Herculis*, mag. 3-4 yellow.

The spectrum very much resembles that of the Sun. II. *a.*

ϵ *Herculis*.

Spectrum faint, but H β and H γ distinctly visible. I. *a.*

ι *Herculis*, mag. 3-4, bluish-white.

H β and especially H γ very strong. I. *a.*

13 *Fl. Lyræ*, mag. 5-4, orange.

There are two bands both in the red and green part of the spectrum, and three in the blue. They are sharply defined towards the violet. III. *a.*

16 *Fl. Lyræ*, mag. 5, bluish-white.

Resembles the spectrum of γ *Lyræ*, but is fainter. I. *a.*

Birmingham red star, R.A. 20^h 36^m 38^s, D. +47° 37' 6", mag. (var.) 8.

Colour intense red, the spectrum tolerably brilliant, with broad bands in the red, yellow, and blue. III. *a.*

35 *Fl. Arietis*, mag. 5, yellow.

The ultra-violet intersected by many bands. III. *a.*

14 *Fl. Arietis*, mag. 4-3, bluish-white.

I noted H β , H γ , and the faint D. I. *a.*

17 *Fl. Tauri*, mag. 6, bluish-white.

H β and H γ very well seen. I. *a.*

27 *Fl. Tauri*, mag. 4, bluish-white.

Identical with the spectrum of η *Tauri*. I. *a.*

δ *Serpentis*, mag. 3-4, white.

Hydrogen lines very strong. I. *a.*

η *Serpentis*, mag. 3, yellow.

Besides D and F there are other groups of lines. II. *a.*

θ *Serpentis*, mag. 4-3, yellow.

Identical with the former. II. *a.*

ζ *Ophiuchi*, mag. 3-2, bluish-white.

A very intense continuous spectrum, only D glimpsed occasionally. I. *b.*

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ι <i>Ophiuchi</i> , mag. 4-5, bluish-white.		
H β and H γ very distinctly visible.		I. a.
κ <i>Ophiuchi</i> , mag. 3-4, yellow.		
Besides D and F, several other faint lines are visible.		II. a.
η <i>Ophiuchi</i> , mag. 2-3, bluish-white.		
H α , H β , and H γ , distinctly seen.		I. a.
σ <i>Ophiuchi</i> , mag. 5, yellow.		
D and F very distinct; other lines suspected in the green.		II. a.
β <i>Ophiuchi</i> , mag. 3, yellow.		
Strongly resembles the solar spectrum; D, b, and G were distinctly noted.		II. a.
γ <i>Ophiuchi</i> , mag. 4-3, bluish-white.		
Brilliant spectrum with strong H β and H γ .		I. a.
ν <i>Ophiuchi</i> , mag. 4-3, white.		
Characterised by very broad hydrogen lines.		I. a.
68 <i>Fl. Ophiuchi</i> , mag. 4-5, white.		
Though the spectrum is feeble, the characteristic hydrogen lines are distinctly visible.		I. a.
72 <i>Fl. Ophiuchi</i> , mag. 3-4, bluish-white.		
Intense spectrum with H β and H γ .		I. a.
Between 70 <i>Fl.</i> and σ <i>Ophiuchi</i> is a star of 7th mag., with a continuous spectrum of great intensity. The colour of the star is brick-red.		
Latterly I could not find this star again, though I determined its situation and registered it in the atlas.		
λ <i>Aquilæ</i> , mag. 3-4, bluish-white.		
H β and H γ very intense.		I. a.
η <i>Aquilæ</i> , mag. var., yellow.		
Its faint spectrum resembles that of the Sun.		II. a.
θ <i>Aquilæ</i> , mag. 3, bluish-white.		
Faint spectrum, with intense F and a fainter H γ .		I. a.
θ <i>Pegasi</i> , mag. 3-4, bluish-white.		
The spectrum is characterised by broad H β , H γ .		I. a.
μ <i>Sagittarii</i> , mag. 4, bluish-white.		
Though the spectrum is very feeble, H β and H γ are distinctly visible.		I. a.
δ <i>Sagittarii</i> , mag. 3-4, bluish-white.		
Intense violet and dark hydrogen lines.		I. a.
λ <i>Sagittarii</i> , mag. 3, bluish-white.		
Intense spectrum, with strong hydrogen lines.		I. a.
ξ <i>Sagittarii</i> , mag. 4, yellow.		
Characterised by a dark D and intense F, and also by many faint lines in the green.		II. a.
ρ <i>Sagittarii</i> , mag. 4, white.		
Resembles the spectrum of π <i>Sagittarii</i> , with strong H β and H γ .		I. a.

Observations of Comets.

Comets *Wells* and *Barnard* have been observed with but little success.

Measures have only been made of the spectrum of the great September comet. The result of all the observations is as follows:—

Date.	Wave-length in mm.			No. of Obs.
	I.	II.	III.	
Nov. 1	561·6	514·9	471·5	4
3	561·5	514·5	470·7	5
6	563·4	515·8	469·6	8
7	562·6	516·0	470·9	10
10	561·8	515·4	471·6	10
11	560·9	515·3	471·7	10
12	562·0	515·4	470·9	10
18	561·4	515·4	471·3	5
Mean ...	561·9	515·3	471·0	62

Comparing these results with those obtained by Dr. de Konkoly ("On the Chemical Constitution of Comets," Royal Hungarian Academy) we obtain the following differences:—

Results of my observations ...	...	561·9	515·3	471·0
Mean of all De Konkoly's observations		560·9	515·6	469·5
Difference ...	...	+1·0	−0·3	+1·5

The intensities of the bands were estimated at 0·2, 1·0, 0·5, on November 1.

Observation of the Solar Eclipse 1882, May 16.

			h	m	s	
First contact ...	...	...	19	0	12·2	Eugen de Gothard
			19	1	1·5	Alexander de Gothard
Last contact ...	...	...	20	47	56·2	Mean 20 ^h 47 ^m 58·5 H.M.T.
			48	08		

Alexander de Gothard observed the first contact a little too late. Instruments: the 10 $\frac{1}{4}$ -inch Browning Reflector, with a reduced aperture of 6 inches, and an achromatic telescope by Bardon et Fils, of Paris.

During the eclipse six successful photographs were obtained.

[These photographs are deposited in the Society's Library.]